Payment is full compensation for:

- Preparing the roadbed
- Furnishing materials when specified in the Pay Item
- Loading and unloading
- Scarifying, spreading, plowing and harrowing
- Mixing and blending in the pit, in the plant, and in the roadway
- Rolling and shaping
- Watering, maintaining, hauling, and priming

B. Stabilizer Aggregate

Stabilizer aggregate will be paid at the Contract Unit Price per ton (megagram) complete, in place, and accepted. Payment will be full compensation for furnishing materials, loading, hauling, unloading, handling, spreading, scarifying, mixing, watering, shaping, and maintenance.

C. Clearing and Grubbing

Clearing and grubbing eligible for payment under the provisions of Subsection 106.10, "Local Material Sources," will be paid according to Section 202.

D. Stripping Excavation

Stripping excavation eligible for payment under the provisions of Section 206 will be paid according to the same section. Payment will be full compensation for the removal of all materials unsuitable for use in the base, subbase, or shoulder.

E. Priming

Bituminous prime will not be measured for separate payment. Its cost is included in the price bid for base.

Payment will be made under:

Item No. 303	Topsoil, sand-clay, or chert (base, subbase, shoulder) course, class ___ including material	Per cubic yard (meter) or square yard (meter)
Item No. 303	Topsoil, sand-clay, or chert (base, subbase, shoulder) course, class___	Per cubic yard (meter) or square yard (meter)
Item No. 303	Topsoil, sand-clay, or chert (base and shoulder) course, class ___ including material	Per cubic yard (meter) or square yard (meter)
Item No. 303	Topsoil, sand-clay, or chert (base and shoulder) course, class ___	Per cubic yard (meter) or square yard (meter)
Item No. 303	Stabilizer aggregate, type___ including material	Per ton (megagram)

303.5.01 Adjustments

General Provisions 101 through 150.

Section 304—Soil Aggregate Construction

304.1 General Description

This work includes constructing base, subbase, or shoulder courses composed of mineral aggregate and soil mortar on prepared subgrade or subbase. Construct according to these Specifications and to the lines, grades, thickness, and cross-sections shown on the Plans or established by the Engineer.

All of the provisions of Section 300 apply to this work.

304.1.01 Definitions

General Provisions 101 through 150.

304.1.02 Related References

A. Standard Specifications

Section 105—Control of Work

Section 109—Measurement and Payment

Section 300—General Specifications for Base and Subbase Courses

Section 412—Bituminous Prime

Section 816—Soil Aggregate Bases

B. Referenced Documents

GDT 21

GDT 49

GDT 59

304.1.03 Submittals

General Provisions 101 through 150.

304.2 Materials

Ensure that materials meet the requirements of the following Specifications:

Material	Section
Soil Aggregate Base	816.2.01
Soil Mortar for Soil Aggregate Base	816.2.02
Bituminous Prime	412

304.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

304.3 Construction Requirements

304.3.01 Personnel

General Provisions 101 through 150.

304.3.02 Equipment

Provide equipment in satisfactory condition for proper construction. Use any applicable equipment as specified in Subsection 412.3.02, “Equipment” for Bituminous Prime.

304.3.03 Preparation

Prepare the subgrade or subbase as specified in Subsection 300.3.03.C, “Preparing the Subgrade” or Subsection 300.3.03.D, “Preparing the Subbase.” Place soil aggregate materials only on a dry, thawed foundation.

304.3.04 Fabrication

General Provisions 101 through 150.

304.3.05 Construction

A. Methods

1. Use any of the methods of mixing material described in Section 300.
2. In lieu of the methods of mixing described in Section 300 and when approved by the Engineer, use one of the following methods:

    a. Produce soil aggregate from an approved source or deposit.

        1) Produce soil aggregate base that will meet the requirements of this Specification after it has been mined, crushed, and processed.

        2) Stockpile the processed material before delivery to the Project.

3) Keep the stockpile large enough during loading operations to ensure that a uniformly blended material is delivered to the Project.

4) Use equipment that will not segregate the material during loading.

b. Produce a soil aggregate using in-place operations

1) Mix one material with the existing roadbed materials.

2) Mix two materials on a prepared subgrade.

B. Placing Material

Use the following steps to spread and mix base, subbase, or shoulder course.

1. Spreading and Mixing
   a. When using soil aggregate base produced from an approved source, uniformly spread the material with an approved mechanical spreader to obtain the desired thickness. Compact and finish according to Subsection 304.3.05.C, "Compacting and Finishing."
   b. When in-place operations are required, use the following procedures for either mixing one material with the existing roadbed materials or mixing two materials on a prepared subgrade:
      1) Uniformly spread the material with an approved mechanical spreader to obtain the desired thickness when mixing two materials on a prepared subgrade. When mixing only one material with the existing roadbed materials, the material may be dumped directly on the subgrade and spread uniformly.
      2) After spreading material, and as soon as weather and moisture conditions permit, mix it by plowing, harrowing, and blading.
      3) Without disturbing the underlying subgrade or subbase, plow the material to its full depth, then harrow with a disc harrow.
      4) Begin plowing alternately at the edges and the center, back and forth, as many times as necessary to produce a thoroughly pulverized and homogeneous mixture.
      5) Compact and finish according to Subsection 304.3.05.C, "Compacting and Finishing."

C. Compacting and Finishing

Construct courses to the maximum thickness as specified in Subsection 300.3.05.C.5, "Compaction."

Use the following steps to compact and finish a base, subbase, or shoulder course:

1. Moisture Content

   Ensure that the moisture content of materials is uniformly distributed and allows compaction to the specified density. Add sufficient water during the mixing operations to provide the optimum moisture content, ± 2 percentage points.

2. Compaction

   After placing and shaping the material to line and grade, compact it to 98 percent of the maximum dry density as determined by representative samples, using GDT 49. When using the material as a base for paved shoulders 6 ft (1.8 m) wide or less, compact to at least 96 percent of the maximum dry density.

   a. One-Course Construction
      1) After compaction, shape to the required grade, line, and cross-section.
      2) Add water as necessary to develop the proper moisture content.
      3) Roll until the surface is smooth, closely knit, and free of cracks.
      4) Correct all defects according to Subsection 300.3.06.B, "Repairing Defects."
   b. Multiple Course Construction
      1) After compacting the first course, shape the surface again to line, grade, and cross-section.
      2) Add water as necessary to develop the proper moisture content.
      3) Spread and compact the second and any succeeding courses without rolling the first course again.
      4) Finish the surface according to the procedure specified for one-course construction.
   c. Irregular Areas

      In places inaccessible to the roller, obtain the required compaction with mechanical tampers approved by the Engineer.

D. Priming Base

After completing the base, apply bituminous prime according to Section 412.

304.3.06 Quality Acceptance

A. Compaction

Determine the maximum dry density from representative samples of compaction material according to GDT 49. Determine the in-place density according to GDT 21 or GDT 59.

B. Finished Surface

1. Transverse Check

   Check the finished surface of the base, subbase, or shoulder course transversely. Using one of the following tools:

   - A template, cut true to the required cross- section and set with a spirit level on non-superelevated sections
   - A system of ordinates, measured from a stringline
   - A surveyor's level

2. Longitudinal Check

   Check the surface longitudinally by placing a 15 ft (4.5 m) straightedge parallel to the centerline.

Ensure that ordinates measured from the bottom of the template, stringline, or straightedge to the surface do not exceed 1/4 in (6 mm) at any point. Rod readings shall not deviate more than 0.02 foot (6 mm) from the required readings.

Immediately correct any variations that exceed the requirements, as specified in Subsection 300.3.06.B, "Repairing Defects."

C. Thickness Tolerances

1. Thickness Measurements
   a. Thickness requirements apply to shoulder construction where the Plans specify a uniform thickness, or where the shoulders will be surfaced.
   b. Determine the thickness of the base, subbase, or shoulder course, by making as many checks as necessary to determine the average thickness.
2. Deficient Thickness
   a. If any measurement is deficient in thickness more than 1/2 in (13 mm), make additional measurements to determine the deficient area.
   b. Correct any area deficient between 1/2 in (13 mm) and 1 in (25 mm) to the design thickness by using one of the following methods according to Subsection 300.3.06.B.
      - Add additional quantities of the same materials and reconstruct to the required thickness
      - Leave in place and accept payment for the materials and area at ½ the Contract Unit Price for the deficient area.
   c. Correct any area deficient in thickness by more than 1 inch (25 mm) by adding additional quantities of the same material and reconstructing to the required thickness in accordance with Subsection 300.3.06.B.
   d. No additional payment will be made for correcting deficient thickness.
3. Average Thickness
   a. The average thickness per linear mile (kilometer) is determined from all measurements within the mile (kilometer) increments.
   b. Do not include in the measurements, any areas that are deficient by more than 1/2 in (13 mm) but less than 1 in (25 mm) and left in place.

D. Priming Base

Prime the completed base according to Section 412.

304.3.07 Contractor Warranty and Maintenance

A. Protecting the Base, Subbase, or Shoulders

Maintain the course until the Engineer determines that it has cured sufficiently and is ready to prime. Maintain by additional wetting, rolling, and blading as necessary. Repair any defects according to Subsection 300.3.06.B, "Repairing Defects."

These protection measures do not relieve the Contractor of maintaining the Work until final acceptance as specified in Section 105.

304.4 Measurement

A. Soil Aggregate Base Course

Soil aggregate base course is measured in square yards (meters) of the specified thickness, as defined in Section 109. The length is measured on the surface along the centerline, and the width as specified on the Plans. Irregular areas, such as turnouts and intersections, are measured to the closest square yard (meter).

Where specified on the Plan, measurements are by the ton (megagram) according to Section 109

B. Soil Mortar

When obtained from a borrow pit, soil mortar for soil aggregate base is measured by the cubic yard (meter) loose volume.

C. Bituminous Prime

Bituminous prime is not measured for separate payment.

304.4.01 Limits

General Provisions 101 through 150.

304.5 Payment

A. Soil Aggregate Base Course

Soil aggregate base course will be paid at the Contract Unit Price per square yard (meter) of the specified thickness, or per ton (megagram), complete and accepted as defined above including Bituminous Prime.

B. Soil Mortar

When obtained from a borrow pit, soil mortar for soil aggregate base will be paid at the Contract Unit Price per cubic yard (meter), including materials and haul.

C. Bituminous Prime

Bituminous prime will not be paid separately; include its cost in the base course bid price.

Payment will be made under:

Item No. 304	Soil aggregate base course, including materials _____ in (mm)	Per square yard (meter)
Item No. 304	Soil aggregate base course, including materials	Per ton (megagram)
Item No. 304	Soil mortar, including materials	Per cubic yard (meter)

304.5.01 Adjustments

General Provisions 101 through 150.

Section 305—Cement Stabilized Soil Aggregate Construction

305.1 General Description

Specifications for this work will be included elsewhere in the Contract.